REMARKS

This is in response to the Office Action dated January 28, 2004. Claims 2, 5, 15, and 17-20 have been amended. Claims 1, 4, 6, and 14 have been cancelled, without prejudice or disclaimer. Claims 23 and 24 have been added by way of this amendment. Claims 1 and 5-13 (of which 1 and 6 have been cancelled by way of this amendment) have been withdrawn from further consideration by the Examiner. Claims 2-4 and 15-24 are pending and under consideration.

Claims 2 and 5 have been amended to incorporate the limitations of claims 14 and 6, respectively. Support for this amendment can be found throughout the specification and on, for example, on page 3, lines 7-11 and page 6, line 18 to page 7, line 35. Accordingly, claim 14 has been cancelled and claim 15 has been amended so that it depends from claim 2, rather than claim 14.

Claims 2 and 5 have also been amended to recite that the antigen is expressed on "granulocyte-macrophage colony stimulating factor (GM-CSF)-primed granulocytes." Support for this amendment can be found throughout the specification and, in particular, on page 7, lines 23-35. Claims 2 and 5 have also been amended to recite that the antigen is recognized "by an ScFv fragment having sequences expressed on said bacteriophage." Support for this amendment can be found throughout the specification and, in particular, on page 10, lines 1-9 and in Figure 7.

Claim 17 has been amended to recite "antigen-recognizing sequence." Support for this amendment can be found throughout the specification and, in particular, on page 7, lines 14-35 and page 9, line 39 - page 10, line 9. Claim 18 has been amended to recite that the phagocyte is "preactivated." Support for this amendment can be found throughout the specification and, in particular, on page 7, lines 23-35. Claim 19 has been amended only to correct an obvious

typographical error. Claim 20 has been amended to recite an antigen-binding "fragment." Support for this amendment can be found throughout the specification and, in particular, on page 1, lines 32-34.

Support for new claims 23 and 24 can be found throughout the specification and, in particular, on page 5, lines 30-39, page 9, line 39 - page 10, line 13 and in Figure 7.

No new matter has been added by way of these amendments.

Enablement

Claims 2-4 and 14-22 have been rejected as allegedly not enabled. Specifically, the Examiner contends that the specification does not enable any phagocyte-recognizing agent recognizing the antigen recognized by at least one bacteriophage isolated from CBS 101481 and CBS 101482. The Examiner also argues that biochemical characteristic of the agent or epitope recognized by the above-cited bacteriophages is not disclosed, that structurally related and unrelated compounds comprising any phagocyte-recognizing agent are not enabled.

Applicants respectfully traverse this rejection, and submit that the present invention as set forth by claims as presented in the instant amendment, is fully enabled by the specification, especially in view of the advanced state of the art. This is particularly evidenced by the fact that the specification, in fact, describes the preparation and screening of a library of ligands, in this case a bacteriophage library, and the successful identification of two bacteriophages which bind to the present antigen on GM-CSF primed granulocytes (see specification, page 7, lines 14-38). Using ScFv and humanized/monoclonal antibodies made from these bacteriophages, the antigen was retrieved by immunoprecipitation and analyzed by gel electrophoresis (see, specification, page 10,

lines 1-22, and Figure 7). Thus, in contrast to the Examiner's reasoning, the possession of a specific ligand to an antigen expressed by a specific set of cells enables the retrieval of the antigen, as well as various binding assays and screening assays for other ligands specific for the same antigen. In fact, claim 2 as currently amended requires that the claimed antigen-recognizing agent is capable of competing with at least one of said bacteriophage in binding to a granulocyte primed with GM-CSF. Such screening or competitive binding assays could be, for example, conducted as a competitive binding assay, screening for agents that compete with either one of the two bacteriophages, as described on page 3, lines 7-11 of the specification. Such competitive binding assays, as well as other or similar forms of screening or binding assays, are, and have long been, well-known in the art.

Thus, while some experimentation may be necessary to enable the invention, no undue or unreasonable experimentation is required for one of skill in the art to practice the full scope of the invention. Specifically, the courts have held that a patent specification complies with the statute even if a "reasonable" amount of routine experimentation is required but such experimentation must not be "undue". *Enzo Biochem Inc. v. Calgene, Inc.* 52 USPQ 2d 1129, 1135 (Fed. Cir. 1999) (citing *In re Wands*, 8 USPQ 2d at 1404). The court in Enzo Biochem looked favorably on the factors set forth in *In re Wands* to consider in determining whether disclosure requires undue experimentation, some of which were quoted by the Examiner as most relevant to the present invention. These factors are discussed below.

(1) The scope of the claim is enabled given that the specification describes two ligands specific for the antigen to which the phagocyte-recognizing or -binding agent recognizes.

(2) The amount of guidance or direction provided by the specification, in view of the advanced state in the art, is sufficient, given that (a) specific ligands for the antigen are provided, enabling retrieval and use of the antigen in screening and competitive binding assays, or, indeed, in the production of monoclonal or polyclonal antibodies; (b) specific cell populations, such as GM-CSF primed granulocytes, which express the antigens are described; and (c) the art of binding and competitive binding assays is highly developed;

(3) Working examples of the screening for, identification of, and retrieval of phagocyte-recognizing agents specific for the antigen in question are provided (see page 7, lines 14-35).

(4) Whatever unpredictability there may be in the art regarding which specific amino acids of an antigen are responsible for the binding of a specific agent, these are not relevant for the present invention. In particular, an antibody with an amino acid change abolishing binding to the antigen called for by the claims would not fall within the scope of the claims and thus is not pertinent to the enablement of these claims. In this context, the Examiner's attention is respectfully directed to MPEP 2164.08(b), stating "...typically, inoperative embodiments are excluded by the language in a claim (*e.g.*, preamble)...". Accordingly, antibodies or other agents that do not bind to the present antigen would not offend compliance with the enablement requirement, since the present claims call for either binding to the same antigen as the specified bacteriophages or for competitive binding with the same. Structural information regarding the antigen is equally irrelevant. While certainly of interest to evaluate the nature of the interaction between a ligand pair, detailed structural information about an antigen such as the 3D-conformation is not needed, or even considered standard information in the state of the art, to prepare or screen for agents that simply bind specifically or competitively to the antigen, as described above.

Accordingly, while some experimentation may thus be required to search for and identify agents binding to the present antigen, such experimentation would not be undue, as it involves routine screening and binding assays exemplified in the present disclosure. This is even more clear with respect to claim 2 as amended, which call for phagocyte-recognizing agents characterized by competitive binding with bacteriophages from the deposited strains and specifies that the antigen is expressed on GM-CSF-primed granulocytes, as well as specific structural characteristics such as comprising an antigen-binding portion of an antibody (claims 15, 20, and 22), or being a monoclonal antibody (claims 16 and 21).

For all of the above reasons, reconsideration and withdrawal of these enablement rejections is respectfully requested.

Written Description

Claims 2-4 and 14-22 have been rejected as allegedly not complying with the written description requirement. Specifically, the Examiner contends that only two phagocyte-recognizing agents are disclosed by the specification, referring to the bacteriophages from the two deposited strains, and that Applicant is not in possession of *any* phagocyte-recognizing agent.

First, it is respectfully submitted that the Examiner is in err. The specification not only provides the two bacteriophages referenced above, but also discloses ScFv fragments as well as humanized antibodies (which are now set forth in new claims 23 and 24, respectively), constructed according to known methods in the art, which recognize the same antigen as the bacteriophages. See page 9, line 39 - page 10, line 9, and Figure 7.

Second, as discussed above, the skilled artisan would readily recognize that being in possession of not only one, but two specific ligand sequences (as well as antibody constructs

thereof) to an antigen, as well as a specific cell population expressing the antigen, means that other agents having the same binding specificity are available by routine methods, including high-throughput screening methods as described in the specification on page 2, lines 12-24.

For all of the above reasons, reconsideration and withdrawal of these written description rejections is respectfully requested.

New Matter Rejection

Claims 14, 15, 17, 18, 19, 20, and 22 have been rejected for allegedly containing new matter. Specifically, the Examiner alleges that there is no support in the specification for any phagocyte-recognizing agent which is capable of competitive binding or inhibition or a bacteriophage from strain CBS101481 or CBS101482 to a phagocyte or a GM-CSF primed granulocyte claimed in claims 14, 18, 19 and 22. Applicants respectfully disagree and point the Examiner's attention to page 3, lines 7-11 and page 6, line 18 to page 7, line 35 of the specification for support. Applicants respectfully request withdrawal of this rejection.

In addition, the Examiner has rejected claims 15, 20 and 22 for containing new matter because any phagocyte-recognizing agent comprising an antigen-binding part of an antibody allegedly is not supported by the specification. Applicants respectfully disagree and point the Examiner's attention to, *e.g.*, page 5, lines 30-39, and page 9, line 39 - page 10, line 13 of the specification. Applicants respectfully request withdrawal of this rejection.

Finally, the Examiner has rejected claim 17 for containing new matter because the specification allegedly does not support any phagocyte-recognizing agent comprising the antigen-specific sequence of bacteriophage from strain CBS101481 or CBS101482. Claim 17 has been amended to recite "antigen-recognizing sequence" rather than "antigen-specific sequence." Support

for this amendment can be found on page 7, lines 14-35 and page 9, line 39 - page 10, line 9 of the specification. Accordingly, Applicants believe that this rejection has been obviated and respectfully request its withdrawal.

Conclusion

In view of the above amendments and remarks, it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue. If there are any other issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: July 28, 2004

Respectfully submitted,

By _____

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